

# Motorola

## HOME RADIO

MODELS  
**63LS1**  
**63LS2**  
**63LS3**

CHASSIS  
**HS-342**

## S E R V I C E M A N U A L

### GENERAL INFORMATION

TYPE - Three-power (AC/DC, Battery) standard broadcast and short wave portable receiver. Five miniature type tubes and a selenium rectifier are used in a superheterodyne circuit.

RECEIVER MODELS	Model	Color
	63LS1	Green
	63LS2	Maroon
	63LS3	Grey

TUBE COMPLEMENT -	Type	Function
	1U4	RF Amplifier
	1R5	Converter
	1U4	IF Amplifier
	1U5	Det-AVC & AF Amp
	3V4	Power Amplifier
	Rectifier	Selenium type

POWER SUPPLY - Operates from 117V AC/DC (15 watts) or from a self-contained battery pack:

Use: Eveready #756  
or Burgess #T6Z60  
or General #362  
or equivalent.

ON OFF &  
VOLUME

TUNING



FIGURE 1. FRONT VIEW OF RECEIVER

IF - 455 Kc

TUNING RANGE - 535 to 1620 Kc  
5.8 to 12.2 Mc

### OPERATING INSTRUCTIONS

TO OPEN BACK COVER. With the fingers, pull the back cover open. When closing the cover, be careful not to pinch the power line cord or other leads between the cover and the cabinet. The back cover will close easier if the top of the cabinet is depressed slightly with the fingers at the same time that the cover is being closed.

HOUSE CURRENT OPERATION. The power cord is located inside the cabinet and can be reached by opening the back cover. Pass the cord through the slot on the side of the receiver before closing the cover. Plug the cord into any 117 volt AC or DC power outlet. Reverse the plug in the outlet if the receiver does not operate from DC power. When operating from AC, reception may sometimes be improved by reversing the power plug in the outlet. It is not necessary that the battery be installed if the receiver is to be operated only from house power lines.

BATTERY OPERATION. Open the back cover and install the battery pack by following the instructions on the label located inside the cover, or refer to Figure 2. Plug the

power line cord into the receptacle on the chassis, or the receiver will not operate from its battery. If the radio is to be operated for a long period of time from house power lines or is to be placed in storage, remove the battery and keep it in a cool place.

IMPORTANT: Never leave a low or rundown battery in the receiver, as it will swell or leak and damage the set.

CONTROLS. The volume control and power switch are combined and are operated with the volume knob (see Figure 1). Select stations with the tuning knob. The standard broadcast dial scale (top scale) is read in kilocycles by adding two zeros to the figures. The short-wave dial scale (bottom scale) is read directly in megacycles.

BANDSWITCH. Standard broadcast or short-wave reception, as desired, is selected with the knob on the back of the chassis (see Figure 2). Rotate the knob to the right for short-wave or to the left for standard broadcast.

LIST APPLICABLE BULLETINS & SUPPLEMENTS HERE:

**BATTERY REPLACEMENT.** Replace the battery pack when low volume or fuzzy tone is noticed. Complete battery replacement instructions will be found inside the back cover, or refer to Figure 2.

**NOTE:** The condition of the battery will not affect operation of the receiver from the house power lines.

**ANTENNA.** No outside antenna is required for standard broadcast station reception, as a loop antenna is built into this receiver. Because of the slightly directional charac-

teristics of the loop antenna, reception from some stations may be improved by rotating the receiver. In extremely noisy locations, rotate the set until minimum noise and maximum signal pickup are obtained.

For short-wave reception, open the back cover, unwind the antenna lead on the rear of the chassis, and extend the lead fully. See Figure 2.

**CAUTION:** Never connect antenna or chassis to a water pipe, radiator, or other ground.

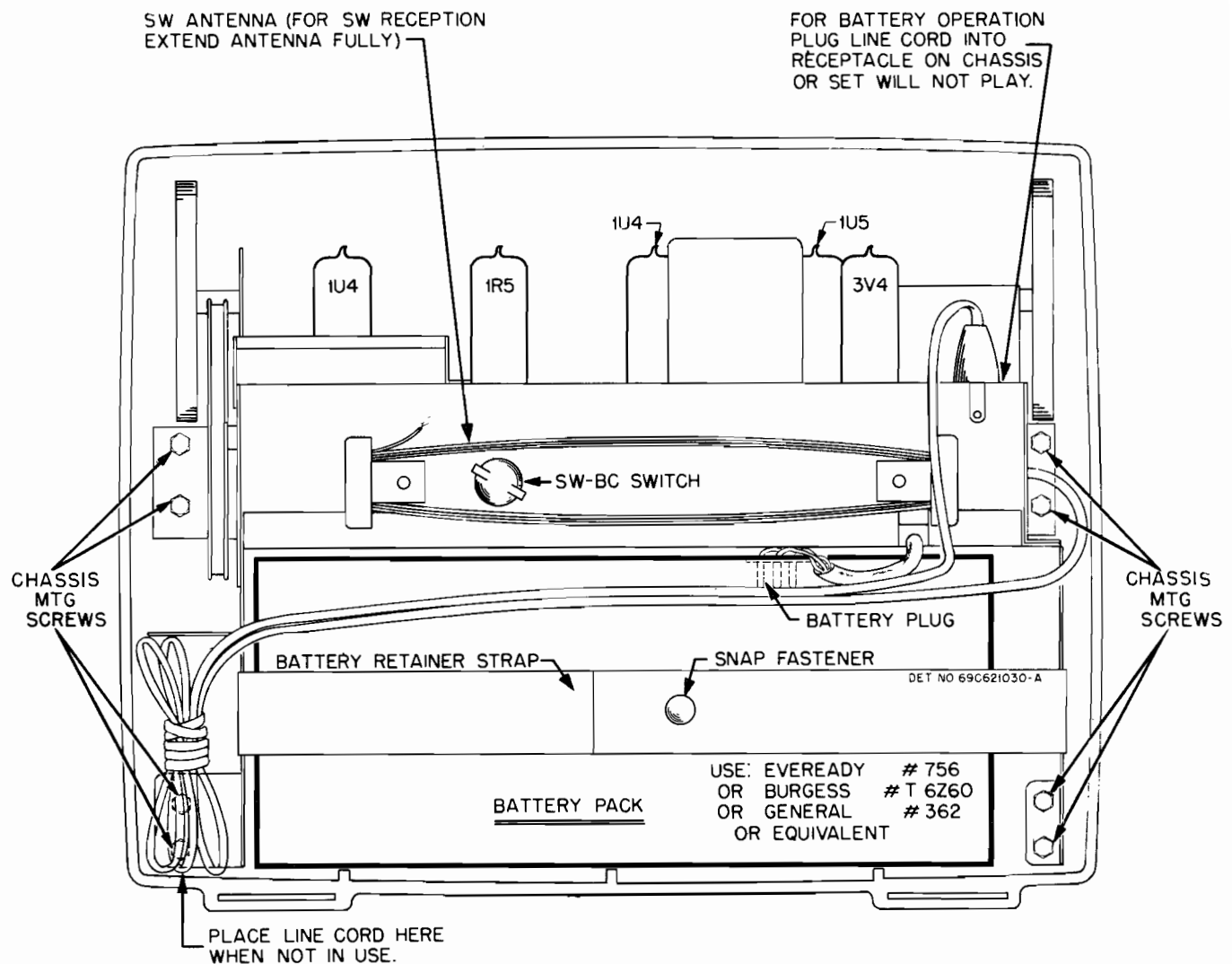


FIGURE 2. REAR VIEW OF RECEIVER

### SERVICE NOTES

The chassis of this receiver is isolated from the AC power line circuit by a capacitor to eliminate the shock hazard when handling the receiver. However, as an additional precaution when aligning or servicing the receiver

from AC, an isolation transformer should be inserted between the power line and chassis.

The tubes are exposed when the rear cover is opened. It is not necessary to remove the chassis to replace tubes.

## TO REMOVE THE CHASSIS FROM THE CABINET:

Refer to Figure 2 for the locations of items mentioned below:

1. Open back cover and remove the battery pack.
2. Remove the screw holding the cover stop cord to the chassis.
3. Remove the two antenna leads from loop panel.
4. Remove the eight screws which attach the bottom cover and chassis to the cabinet.
5. From the back of the cabinet, slide out the entire chassis, bottom cover, and speaker.

## REAR COVER HINGE INSTALLATION

The proper method for installing a new hinge is shown in Figure 3. Note that the underside of the cabinet should

rest on an iron block during the heating process to prevent the formation of a heat bubble on the bottom of the cabinet.

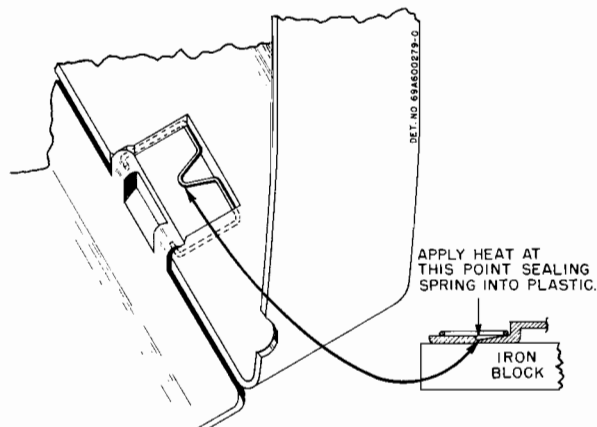


FIGURE 3. REAR COVER HINGE INSTALLATION

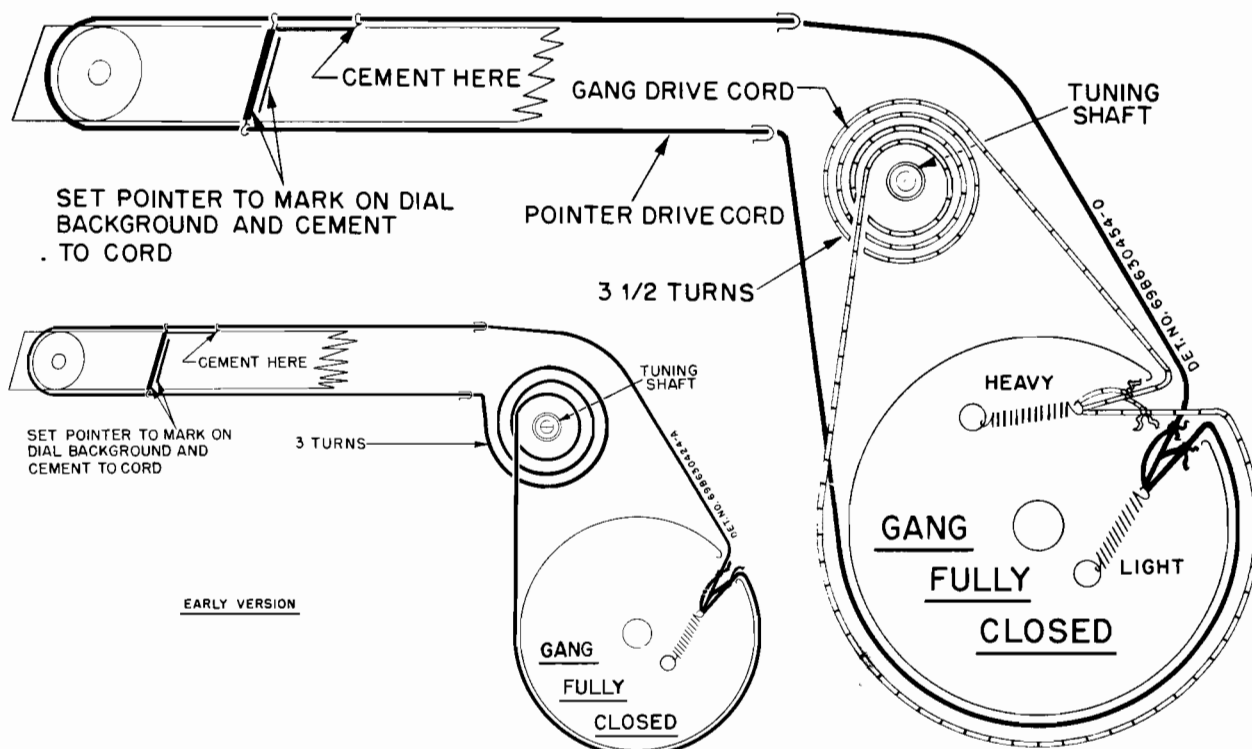


FIGURE 4. DIAL CORD RESTRINGING DETAIL

## ALIGNMENT

NOTE: The receiver may be operated either from a battery or from the commercial power lines during alignment. If AC power is used, it is recommended that an isolation transformer be placed between the power lines and the receiver. If an isolation transformer is not available, connect the low side of the signal generator to B- through a .1 mf capacitor.

### PROCEDURE:

1. Connect a low range output meter across the speaker voice coil.
2. Connect the low side of the signal generator to B-.
3. Set the signal generator for 400 cycle, 30% modulation.
4. Turn the receiver volume control to maximum.
5. Use a small fibre screwdriver for aligning the IF and diode transformers.
6. Adjust the signal generator output to produce .40 volts (.05 watts) across the voice coil. As stages are aligned, reduce the generator output (not receiver volume control) to maintain the .40 volt level, to avoid overloading the receiver.
7. See Figure 5 for adjustment locations and the following chart for procedure.

# ALIGNMENT CHART

STEP	DUMMY ANTENNA	GENERATOR CONNECTION	GENERATOR FREQUENCY	GANG SETTING	ADJUST	REMARKS
<b>IF ALIGNMENT</b>						
1.	.1 mf	Grid of conv. (pin 6, 1R5)	455 Kc	Fully opened	1, 2, 3 & 4 (IF cores)	Adjust for maximum.
<b>BC RF ALIGNMENT</b>						
2.	.1 mf	Grid of conv. (pin 6, 1R5)	1620 Kc	Fully opened	5 (Osc trim)	Adjust for maximum.
3.	-	Radiation loop*	1400 Kc	Tune for max.	7 & 8 (RF and Ant trim)	Adjust for maximum.
4.	-	Radiation loop*	600 Kc	Tune for max.	6 (Osc core)	Simultaneously tune gang and adjust core for maximum signal.
5.	-	Radiation loop*	1620 Kc	Fully opened	5 (Osc trim)	Readjust for maximum, if necessary.
6.	-	Radiation loop*	1400 Kc	Tune for max.	7 & 8 (RF and Ant trim)	Readjust for maximum, if necessary. NOTE: After chassis is reassembled in cabinet, install battery, close cover and readjust ant trim 8 for max. Trim is accessible through hole in cover.
<b>SW RF ALIGNMENT</b>						
7.	400 ohms	Junction of SW ant wire & SW antenna coil	12.2 mc	Fully opened	9 (SW Osc trim)	Adjust for maximum (check image frequency which should fall at 13.11 mc)
8.	400 ohms	Junction of SW ant wire & SW antenna coil	11.5 mc	Tune for max	10 (SW Ant trim)	Adjust for maximum

\* Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep loops at least 12" apart.

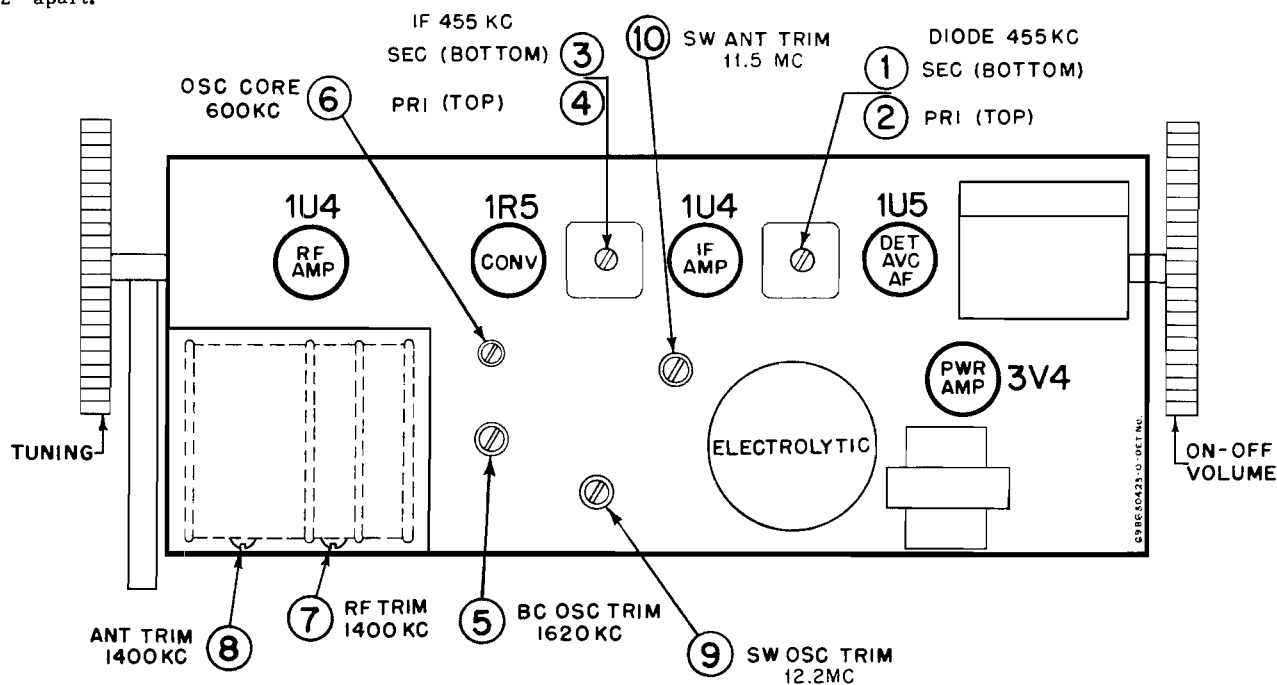


FIGURE 5. TUBE AND TRIMMER LOCATIONS

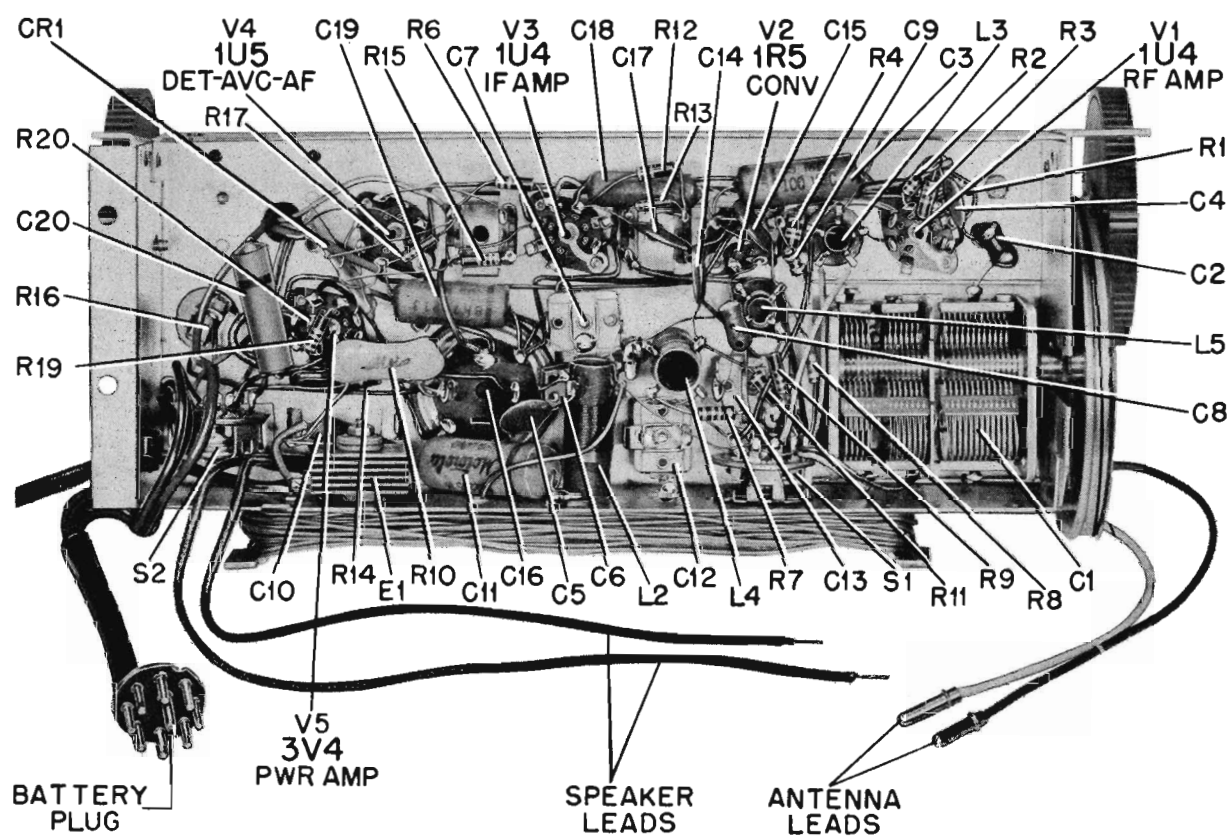
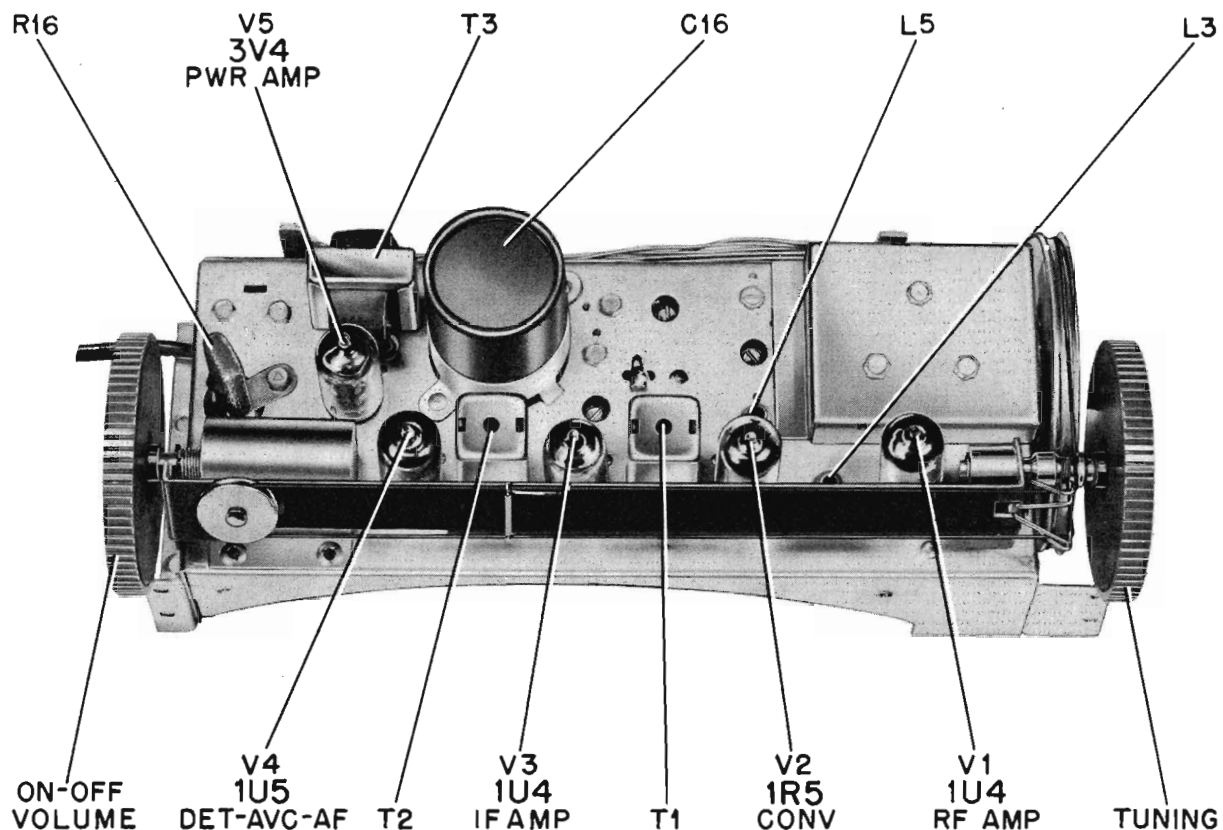
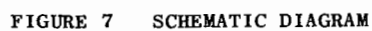


FIGURE 6. PARTS LOCATIONS



## REPLACEMENT PARTS LIST

NOTE: When ordering parts, specify model number of set in addition to part number and description of part.

Ref. No.	Part Number	Description	List Price	Ref. No.	Part Number	Description	List Price
<b>CHASSIS PARTS - ELECTRICAL</b>				R-6	6R3927	2.2 meg 20% 1/2W.....doz	1.20
<u>Capacitors</u>				R-7	6R2035	82 10% 1/2W.....doz	1.20
C-1	19C621583	Variable, 3-gang.....	3.75	R-8	6R6434	27,000 10% 1/2W.....doz	1.20
C-2	21R115639	Ceramic: 100 mmf 500v.....	.20	R-9	6R6038	1500 10% 1/2W.....doz	1.20
C-3	8R9805	Paper: .05 mf 100v.....	.20	R-10	17A76986	Wire wound: 150 10% 2 1/2W... .30	
C-4	21R482726	Ceramic, disc: 10,000 mmf 450v.....	.30	R-11	6R6320	10,000 10% 1/2W.....doz	1.20
C-5	21R482726	Ceramic, disc: 10,000 mmf 450v.....	.30	R-12	6R2109	10 meg 20% 1/2W.....doz	1.20
C-6	21R6676	Mica: 300 mmf 500v.....	.35	R-13	6R6004	1.0 meg 20% 1/2W.....doz	1.20
C-7	20K621563	Trimmer, mica: 2mmf - 18 mmf	.40	R-14	6R6269	820 10% 1/2W.....doz	1.20
C-8	21R115639	Ceramic: 100 mmf 500v ....	.20	R-15	6R6004	1.0 meg 20% 1/2W.....doz	1.20
C-9	21R115884	Ceramic: 10 mmf 500v.....	.20	R-16	17B611589	Wire wound: 2000 5% 10W... .75	
C-10	8K471635	Paper: .05 mf 400v.....	.25	R-17	6R6004	1.0 meg 20% 1/2W.....doz	1.20
C-11	8K490210	Molded, paper: 100,000 mmf 200v.....	.25	R-18	18A621584	Volume Control: 1 meg; with switch.....	1.25
C-12	20K621562	Trimmer, mica: 2mmf - 18 mmf	.40	R-19	6R6270	220 10% 1/2W.....doz	1.20
C-13	20K621562	Trimmer, mica: 2 mmf - 18 mmf	.40	R-20	6R6229	1000 10% 1/2W.....doz	1.20
C-14	21R482726	Ceramic, disc: 100,000 mmf 450v.....	.30	<u>Switch</u>			
C-15	21R482726	Ceramic, disc: 100,000 mmf 450v.....	.30	S-1	40B611599	Switch, SW-BC: 3 PDT	1.55
C-16	23B611598	Electrolytic: 100 mf, 80 mf/150v; 200 mf/10v....	3.55	S-2	40B621572	Rotary Switch: 5 PDT (AC/DC battery selector).....	.85
C-17	21R482726	Ceramic, disc: 100,000 mmf 450v.....	.30	<u>Transformers</u>			
C-18	8R9817	Paper: .02 mf 100v.....	.25	T-1,2	24K600824	IF and Diode Transformer: 455 Kc; complete.....	1.45
C-19	8K71213	Paper: .05 mf 100v.....	.20	T-3	25B621570	Output Transformer.....	1.65
C-20	8R4736	Paper: .002 mf 400v.....	.20				
<u>Capacitor Resistor</u>				Part Number	Description	List Price	
CR-1	21B621535	Capacitor-Resistor: 2000 mmf, 150 mmf, 150 mmf, 10,000 mmf, 5000 mmf, 4.7 meg, 1.0 meg, 3.3 meg, 10 meg	1.20	<b>CHASSIS PARTS - MECHANICAL</b>			
<u>Rectifier</u>				71V630129	Background Assembly, dial scale...	1.25	
E-1	48K692077	Rectifier, selenium: half wave; 75 ma	1.90	42A471704	Bracket, SW antenna retainer.....	.05	
<u>Coils</u>				7A621567	Bracket, volume control mtg.....	.25	
L-1	24K621595	Antenna Loop and Panel Assembly .....	1.25*	43A692012	Bushing, line cord strain relief (use with 43K692013 retainer)....	.10	
L-2	24B621565	Coil, short-wave antenna....	.75	42A620021	Clamp, electrolytic mtg.....	.15	
L-3	24B611539	Coil, broadcast RF.....	.85	42A621671	Clip, coil form mtg (L-2 & L-4 mtg).....doz	.50	
L-4	24B621587	Coil, short-wave oscillator..	.75	42B485548	Clip, IF transformer mtg.....doz	.35	
L-5	24B621561	Coil, broadcast oscillator..	1.00	30K621667	Cord, line: with plug.....	.60	
<u>Speakers</u>				71V630130	Cover, Assembly, chassis bottom and battery retainer.....	2.00	
LS-1	50D621712	Speaker: 6" x 9"; 3.2 ohm VC exch	8.95* 6.70*	15A621571	Cover, volume control.....	.15	
<u>Resistors</u>				5S7823	Eyelet, snap-in (volume control cover mtg).....doz	.15	
Nqte: All resistors are insulated carbon type unless otherwise specified				36K472940	Knob, selector (SW-BC).....	.40	
R-1	6R6015	220,000 20% 1/2W.....doz	1.20	2S7051	Nut, hex palnut: 3/8-32 x 9/16 (volume control mtg).....doz	.15	
R-2	6R3988	5.6 meg 10% 1/2W.....doz	1.20	29K5401	Pin, antenna connector.....doz	.20	
R-3	6R6004	1.0 meg 20% 1/2W.....doz	1.20	28K77272	Plug, battery: 9-prong.....	.15	
R-4	6R6012	33,000 20% 1/2W.....doz	1.20	52A621636	Pointer,.....	.15	
R-5	6R6031	100,000 10% 1/2W.....doz	1.20	43A692013	Retainer, line cord strain relief bushing (use with 43A692012 bushing).....	.05	
				1V621719	Shaft, tuning.....	.70	
				9R119871	Socket, tube: miniature; 7-prong..	.15	
				41A14244	Spring, tension (gang drive cord)doz	.55	
				41A472675	Spring, tension (pointer drive cord).....doz	.30	
				42K621613	Strap, battery mtg: with fastener socket.....	.35	

Part Number	Description	List Price	Part Number	Description	List Price
42K621673	Strap, battery mtg: with fastener stud.....	.40	13K621659	Cover, handle mtg (over ends of handle)	.80
4K501364	Washer, "C" (tuning shaft mtg) doz	.15	61B621611	Crystal, dial.....	.75
4A630072	Washer, formed SW-BC (selector knob mtg).....	.15	13B621597	Grille, speaker.....	.65
			55A620028	Handle, carrying: green plastic; less spring (63LS1).....	.35
			55K620029	Handle, carrying: maroon plastic less spring (63LS2).....	.35
			55K620027	Handle, carrying: grey plastic less spring (63LS3).....	.35
CABINET PARTS			36B621663	Knob, control; green (tuning and volume) (63LS1).....	.80
16E621388	Cabinet: green plastic; less handle back cover, dial crystal, dial scale, and medallion (63LS1) ....	9.10	36K621664	Knob, control; maroon (tuning and volume) (63LS2).....	.80
16K621389	Cabinet: maroon plastic: less handle, back cover, dial crystal, dial scale, and medallion (63LS2)	9.10	36K621665	Knob, control: grey (tuning and volume) (63LS3).....	.80
16K621390	Cabinet: grey plastic: less handle back cover, dial crystal, dial scale, and medallion (63LS3).....	9.10	41K621585	Latch, spring (back cover retainer)	.05
1V630334	Cover Assembly, cabinet back: green; complete with latch spring, hinges, and stop cord less antenna loop (63LS1) .....	3.75	29A690089	Lug, clinch (for stop cord)....doz	.20
1V630335	Cover Assembly, cabinet back: maroon; complete with latch spring hinges, and stop cord; less antenna loop (63LS2) .....	3.75	13C722622	Medallion (on speaker grille)....	.25
1V630336	Cover Assembly, cabinet back: grey complete with latch spring, hinges, and stop cord; less antenna loop (63LS2).....	3.75	71V630516	Plate Assembly, handle mtg and latch spring .....	.45
			3S120452	Screw, thread cutting: #5 x 3/8 slotted, flat head (dial scale & crystal mtg).....doz	.30
			34C621596	Scale, dial.....	1.30
			2S400170	Speednut (antenna loop mtg) ...doz	.15
			41A620014	Spring, handle (inside plastic handle).....	.15
			41A691939	Spring, hinge (back cover mtg).doz	.30
			14K620019	Tubing, insulating: fibre (handle mtg).....doz	.15

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

\*Plus Federal Excise Tax At Current Rate